






First records of *Clubiona hitchinsi* Saaristo, 2002 on Ascension Island (Araneae, Clubionidae)

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Abstract. *Clubiona hitchinsi* Saaristo, 2002, previously known from the Seychelles and French Polynesia, is newly recorded from Ascension Island, based on comparison of the Ascension specimens against two paratypes. The first detailed figures of the endogyne, based on a paratype, are provided. Characters in this species not found in European species of *Clubiona* Latreille, 1804 but found in the misplaced *hystrix*-group in Asia—namely the presence of a spine at the tip of the cymbium, retrolateral tibial apophysis with spine-like tip, and presence of a keel on the tegulum in the male, and copulatory ducts running on the posterior side in the genitalia of the female—are discussed.

Keywords. British Overseas Territories, clubionid, island, non-native, sac-spider

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Introduction

The genus *Clubiona* Latreille, 1804 currently contains 524 species distributed worldwide (WSC 2023). Of these species, none has been formally recorded from Ascension Island, a remote inhabited island of volcanic origin in the South Atlantic Ocean (Ashmole and Ashmole 2000). Duffey (1964) reported “*Clubiona* sp. aff. *vachoni*” from Boatswain Bird Island and “*Clubiona* spp.” from unlocalized areas of the main island but did not provide any illustrations or descriptions.

Recently, one of us (DS) has been sorting Duffey’s spider materials, deposited at the Natural History Museum, London (NHMUK), and this included the clubionid materials mentioned by Duffey (1964). Examination of these specimens clearly indicated all of them belonged to a single morphospecies, found both on the main island and Boatswain Bird Island. These materials

were then compared against the literature to identify possible related species. Recent materials also sent to DS from the Ascension Island Conservation Directorate invertebrate collection (ASC) contained fresh specimens of this species.

Saaristo (2002) described *Clubiona hitchinsi* Saaristo, 2002 based on both sexes from the Seychelles, also providing another taxonomic account of the species in his posthumous book chapter on Seychellois spiders (Saaristo 2010). We immediately noticed a resemblance between the Ascension Island materials and the illustrations of *C. hitchinsi* in Saaristo’s work. YMM recently had the opportunity to directly examine and photograph type specimens of *C. hitchinsi*, housed in the Zoological Museum of the University of Turku (MZT), providing definitive evidence that this species is conspecific with the specimens from Ascension.

Thus, in this work, we formally report *C. hitchinsi*

for the first time from Ascension Island, also thereby solving the taxonomic puzzle of Ascension's clubionids nearly six decades after the first report of the family from this island.

Methods

Specimens were examined under a binocular stereomicroscope. Images of specimens from Ascension Island were made using a Canon EOS 6D Mark II attached to a Leica MZ12.5 stereomicroscope, with images stacked using Helicon Focus software. Photographs of paratypes were obtained using an Olympus Camedia E-520 camera attached to an Olympus SZX16 stereomicroscope in the Zoological Museum, University of Turku. Digital images at different focal planes were stacked with Helicon Focus v. 8.1.1. Photographs of dissected endogynes were made after digesting tissues in a 10% KOH aqueous solution. Abbreviations: ASC = Ascension Island Conservation Directorate collection, Georgetown, Ascension Island (it is intended in the future that the ASC invertebrate collection will be

donated and moved to the Saint Helena National Trust, Jamestown, Saint Helena); Bc = bursa copulatrix; Cd = copulatory ducts; Co = copulatory openings; E = embolus; imm. = immature; NHMUK = Natural History Museum, London, United Kingdom; RTA = retrolateral tibial apophysis; Sp = spermathecae; Spc = spine at top of cymbium; Ti = spine-like tip of retrolateral tibial apophysis; Tk = tegular keel; WSC = World Spider Catalog; MZT = Zoological Museum, University of Turku, Finland. Maps (except the topographic map of Ascension) were made with SimpleMappr (Shorthouse 2010).

Results

Clubiona hitchinsi Saaristo, 2002 (Figs. 1–5)

Clubiona hitchinsi Saaristo 2002: 4, figs. 6–10 (♂, ♀); Saaristo 2010: 54, figs. 5.1–4 (♂, ♀); Dierkens and Ramage 2016: 140, figs. 7–9 (♂, ♀).

Clubiona sp. aff. *vachoni*—Duffey 1964: 241, 250 (misidentification, examined).

Clubiona spp.—Duffey 1964: 242, 250 (misidentification, examined).

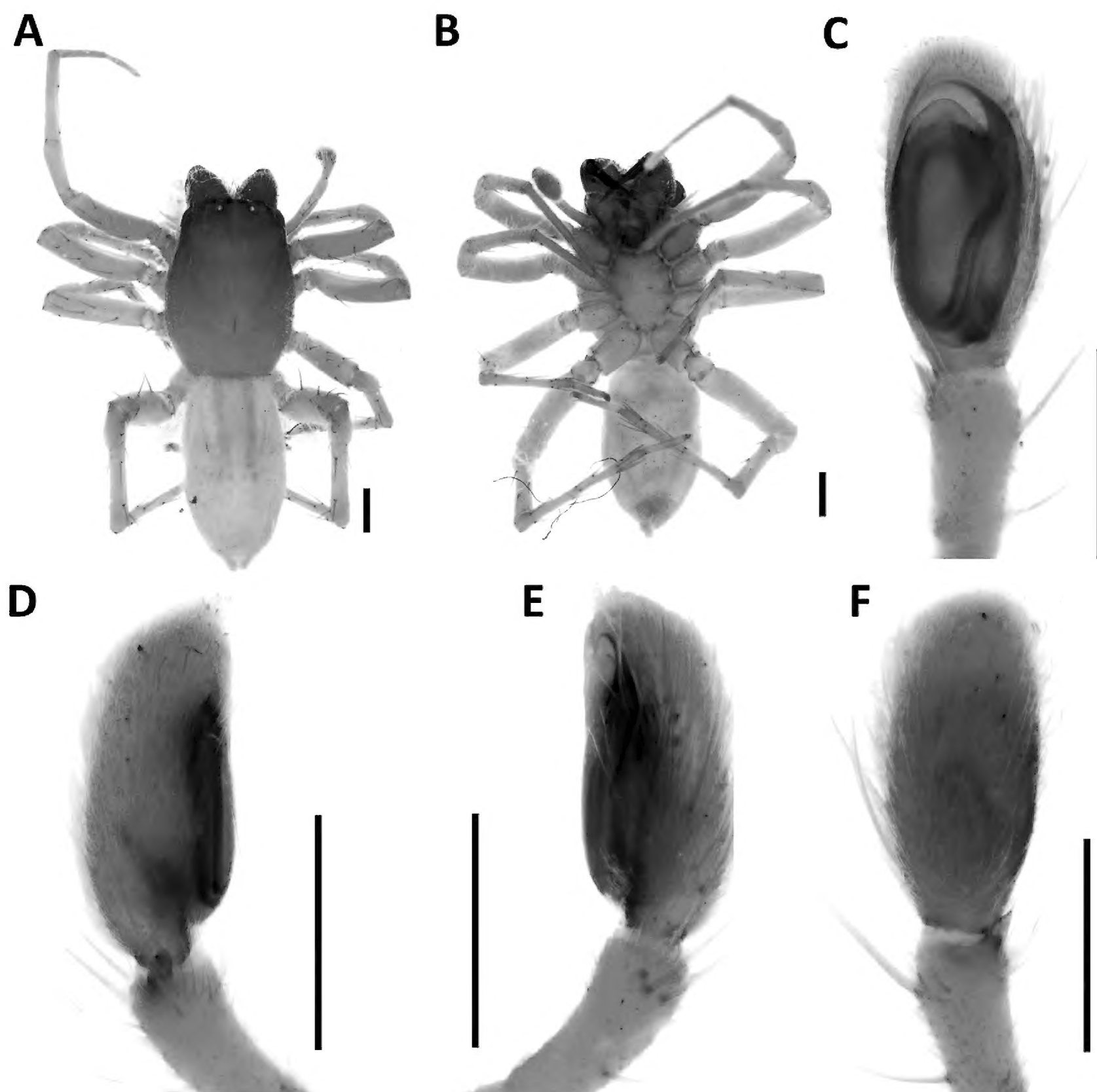


Figure 1. *Clubiona hitchinsi*. Male from Ascension Island. **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Right palp, ventral view. **D.** same, retrolateral view. **E.** same, prolateral view. **F.** same, dorsal view. Scale bars = 1 mm.

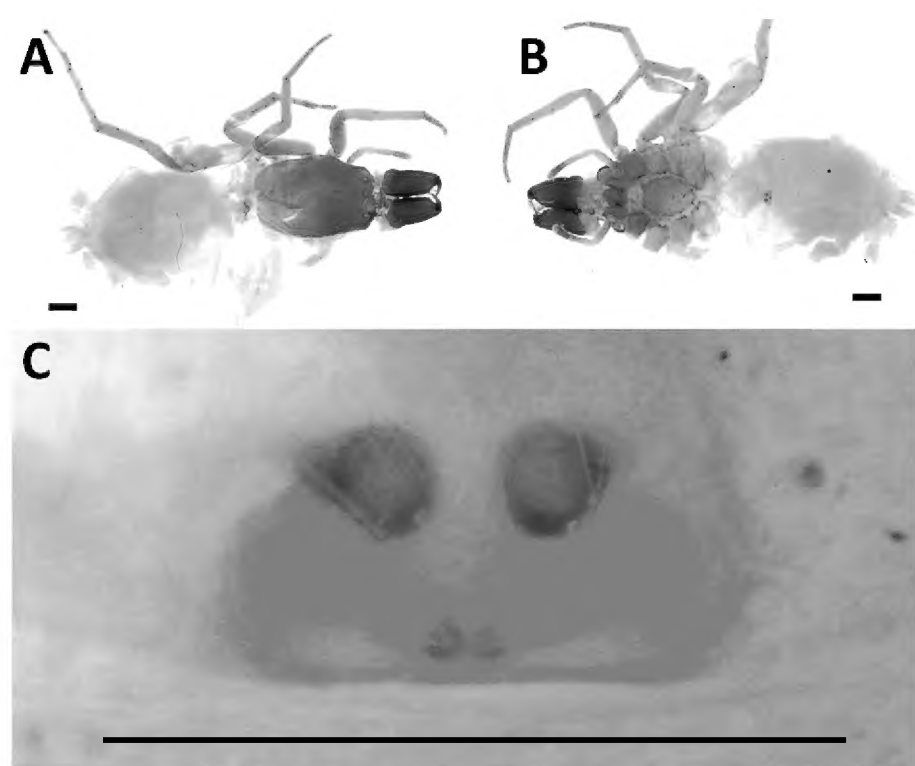


Figure 2. *Clubiona hitchinsi*. Female from Ascension Island. **A.** Habitus, dorsal view. **B.** Habitus, ventral view. **C.** Epigyne (note whole abdomen cleared by earlier worker), ventral view. Scale bars = 1 mm.

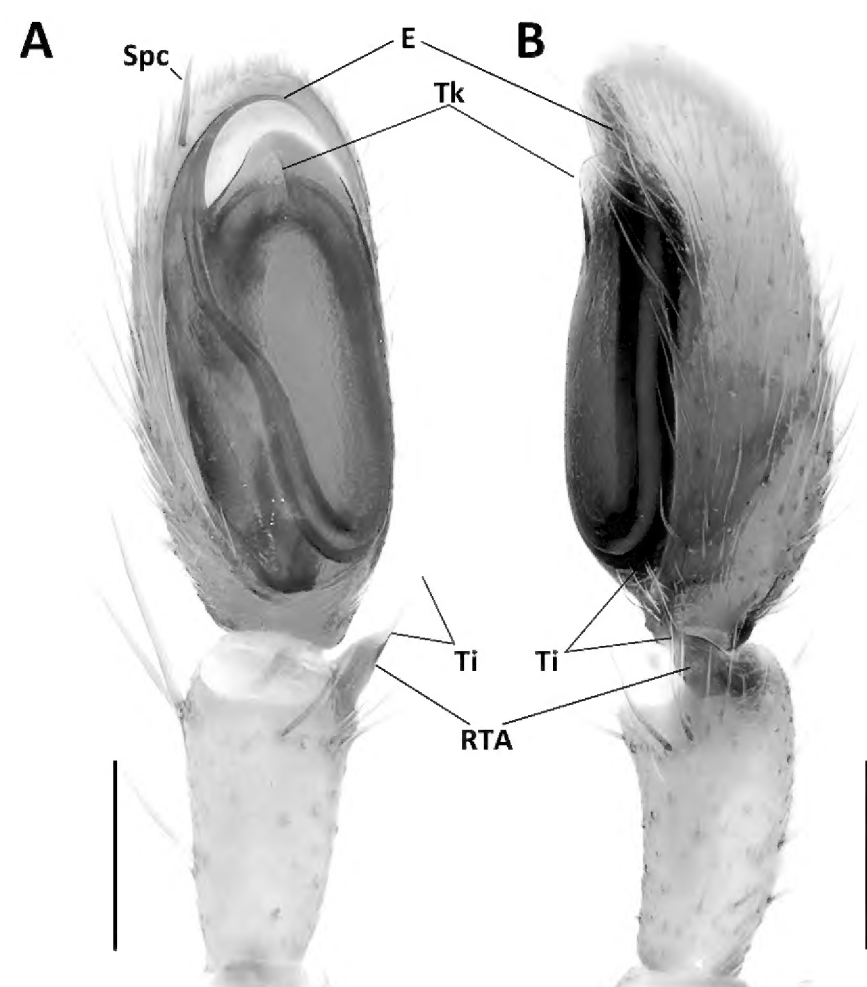


Figure 3. *Clubiona hitchinsi*. Paratype male from Seychelles. **A.** Left palp, ventral view. **B.** Same, retrolateral view. Scale bars = 0.2 mm. Abbreviations: embolus (E); retrolateral tibial apophysis (RTA); spine on the cymbium (Spc); spine-like tip (Ti), tegular keel (Tk).

Materials examined. UNITED KINGDOM – **Saint Helena, Ascension and Tristan da Cunha** • Boatswain Bird Island; [–07.936, –014.307]; [12–31.IX.1957]; E. Duffey leg.; No. 132; 1 ♂, NHMUK • Boatswain Bird Island; 07°56′09″S, 014°18′27″W; 98 m.a.s.l. alt.; 12–31. IX.1957; E. A. Duffey leg.; No. 109; 1 ♀, NHMUK • Ascension Island; [–07.94, –014.37]; [X–XI.1957]; E. Duffey leg.; No. 62; 1 ♂ NHMUK; • Ascension Island; [–07.94, –014.37]; [X–XI.1957]; E. Duffey leg.; No. 4; 1 ♂, 1 immature • Cricket Valley; –07.946449, –014.331962; 450 m a.s.l.; native ferns, guava; 26/07/2022; A. Sharp

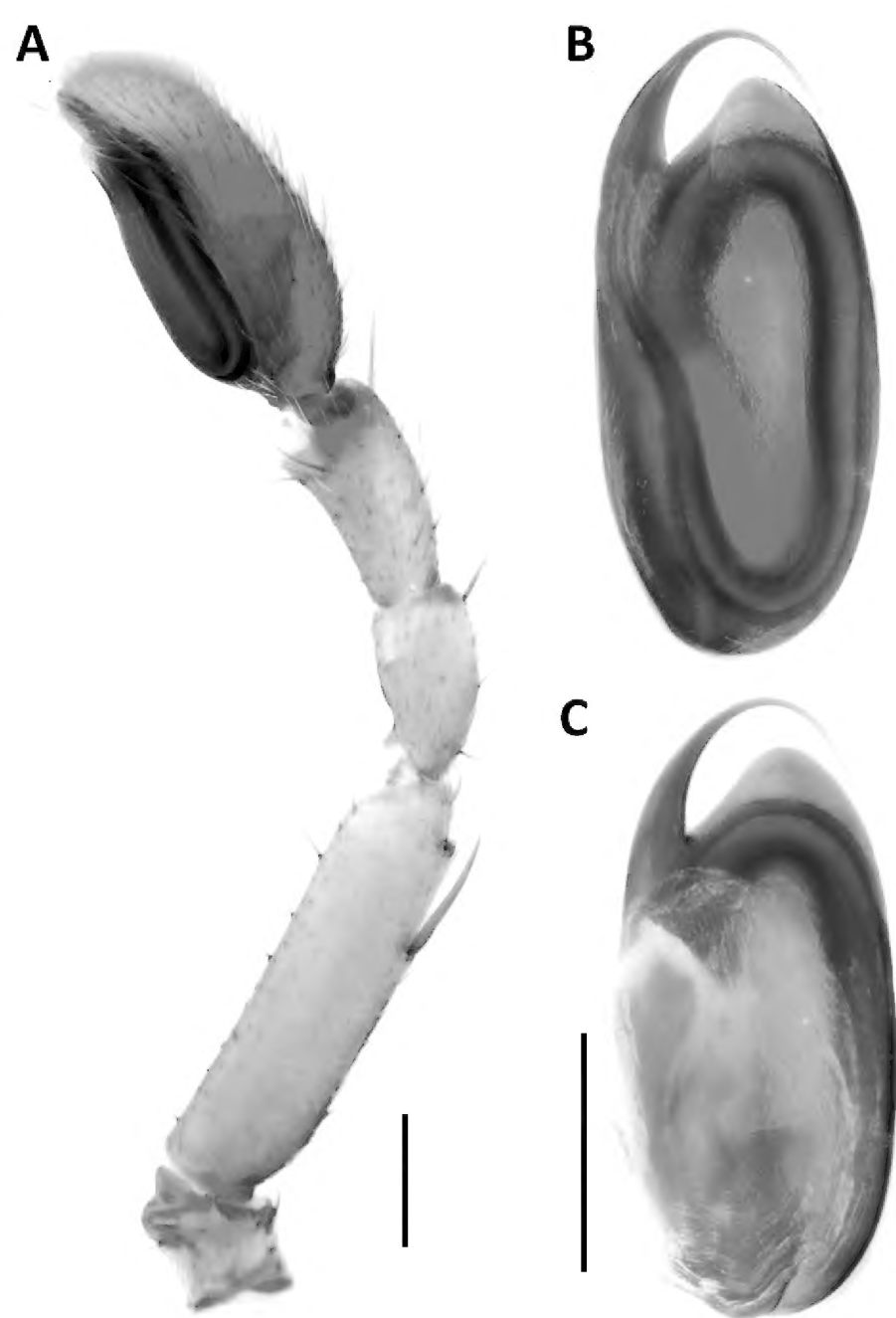


Figure 4. *Clubiona hitchinsi*. Paratype male from Seychelles. **A.** Whole palp, retrolateral view. **B.** Dissected bulb, dorsal view. **C.** Dissected bulb, ventral view. Scale bars = 0.2 mm.

leg.; 1 ♀; ASC CV450 • Nature Trail; –07.94935, –014.34268; mixed woodland; 02/08/2022; A. Sharp leg.; 1 ♂; ASC NE650 • Mountain Road; –07.948184, –014.355038; mixed woodland; 09.VIII.2022; A. Sharp leg.; 1 ♀; ASC NW550. SEYCHELLES – **North Island** • North Island; [–04.39, 055.24]; [30.VII.2000]; J. Gerlach leg.; paratypes; 1 ♂, 1 ♀, MZT AA 1.327.

Identification. The Ascension specimens (Figs. 1, 2) were compared against paratypes of *C. hitchinsi* (Figs. 3–5) and matched in both genitalic and somatic characters, clearly indicating that they are conspecific.

Diagnosis. *Clubiona hitchinsi* has several characters unknown in the European *Clubiona* species groups but present in the *hystrix* group (see below). Firstly, it possesses a spine (Spc) on the tip of cymbium (absent in European *Clubiona*; present in the Asian *C. ericius* Chrysanthus, 1967 and *C. kowong* Chrysanthus, 1967). Secondly, the male retrolateral tibial apophysis (RTA) is very long (Figs. 1, 3, 4), with a spine-like tip (Ti) (shared with the Asian *C. damirkovaci* Deeleman-Reinhold, 2001, *C. maipai* Jäger & Dankittipakul, 2010, and *C. kuu* Jäger & Dankittipakul, 2010). Thirdly, the tip of the tegulum has a kind of a keel (Tk), also unknown in males of other species except *C. hystrix* Berland, 1938. Saaristo (2010) illustrated this keel like a lamella, and the tibial apophysis was drawn with a much shorter tip (our

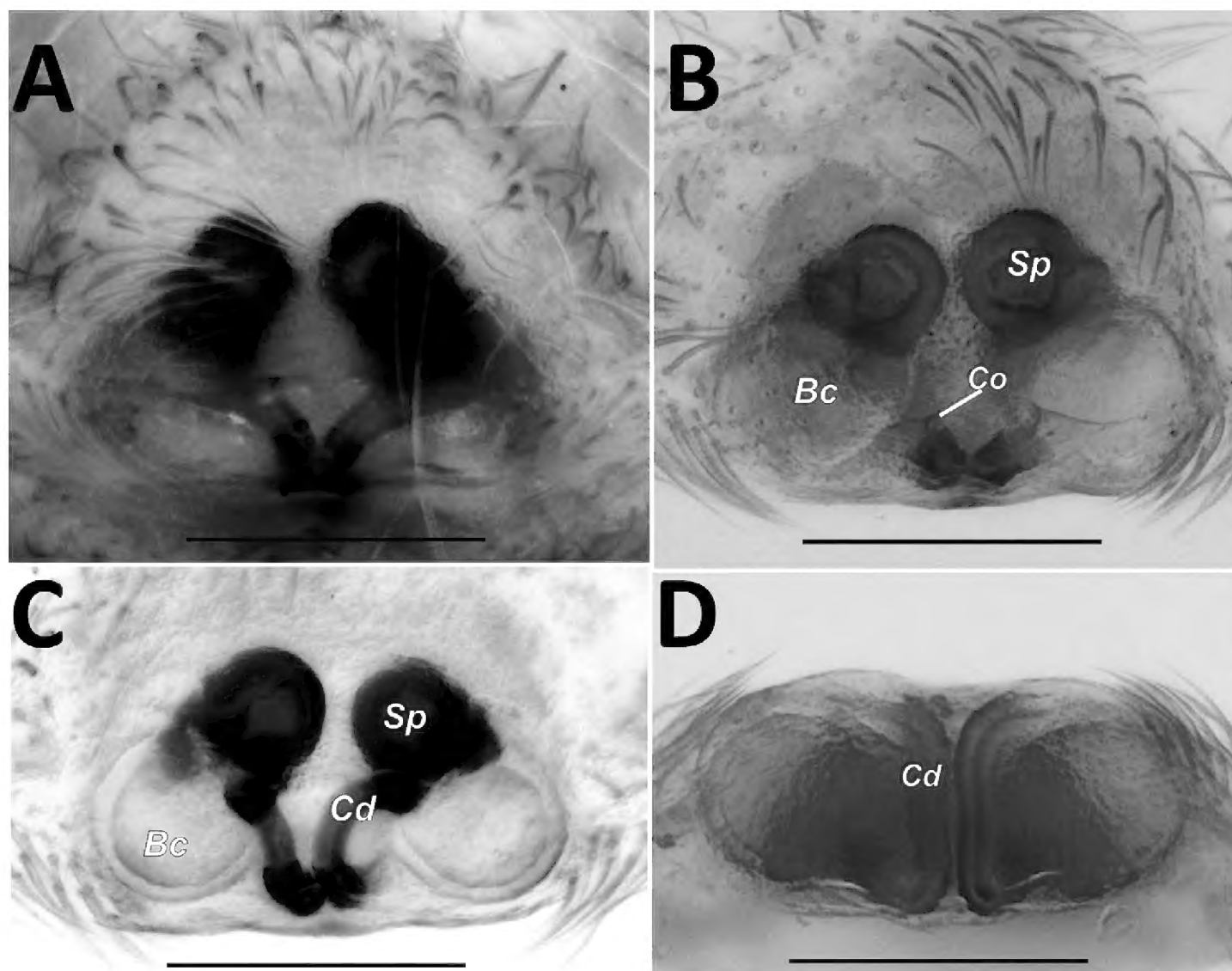


Figure 5. *Clubiona hitchinsi*. Paratype female from Seychelles. **A.** Epigyne (uncleared), ventral view. **B.** Epigyne (cleared), ventral view. **C.** Vulva (cleared), dorsal view. **D.** Vulva (cleared), caudal view. Scale bars = 0.2 mm. Abbreviations: bursa copulatrix (Bc); copulatory ducts (Cd); copulatory openings (Co), spermathecae (Sp).

figures were made from the same paratype). The combination of the three above character states together differentiates it from the other aforementioned *hystrix*-group species. In the female, the epigyne has copulatory ducts (Cd) running on the posterior side (Fig. 5D), and the copulatory openings (Co) are also very small and almost indistinct (Fig. 5A, B).

Discussion

The formal report of *C. hitchinsi* from Ascension given herein solves a nearly six-decade puzzle, in which the species-level identity of clubionids collected by Eric Duffey was not known with certainty. We also thus confirm yet another invasive species of spider on Ascension Island, with invasive species significantly outnumbering valid endemics (Sherwood et al. in preparation). Furthermore, this provides further evidence that *C. hitchinsi* is not a Seychellois endemic species. Previously, Dierkens and Ramage (2016) had already recorded *C. hitchinsi* from French Polynesia, postulating it may be a junior synonym of *C. alveolata* L. Koch, 1873, which is known from several Pacific islands (WSC 2023). However, until the types of *C. alveolata* are redescribed, this cannot be confirmed with certainty and making a synonymy outside the scope of this work, although we agree that the illustration by Koch (1873) does have a notable resemblance to the palp of *C. hitchinsi*.

Clubiona hitchinsi clearly belongs to the *hystrix* group. The other known species of this group are: *C. hystrix* Berland, 1938; *C. alveolata*; *C. damirkovaci* Deeleman-Reinhold, 2001; *C. ericius* Chrysanthus, 1967;

C. kowong Chrysanthus, 1967; *C. kuu* Jäger & Dankittipakul, 2010; *C. maipai* Jäger & Dankittipakul, 2010; *C. meraukensis* Chrysanthus, 1967; *C. papuana* Chrysanthus, 1967; *C. sertungensis* Hayashi, 1996; and *C. zhangyongjingi* Li & Blick, 2019. All the characters given in the diagnosis may indicate that this species and, indeed, all of those placed in the *hystrix* group, deserve transferal to a different genus. Given the similarity of the genitalia and the indigenous distribution of this species group being in Asia (Jäger 2012), with records in other areas representing non-native introductions (e.g. Dierkens and Ramage 2016; this work), we consider it likely they all belong to *Invexillata* Versteirt, Baert & Jocqué, 2010 but more materials should be considered and examined, which is outside the scope of the present work.

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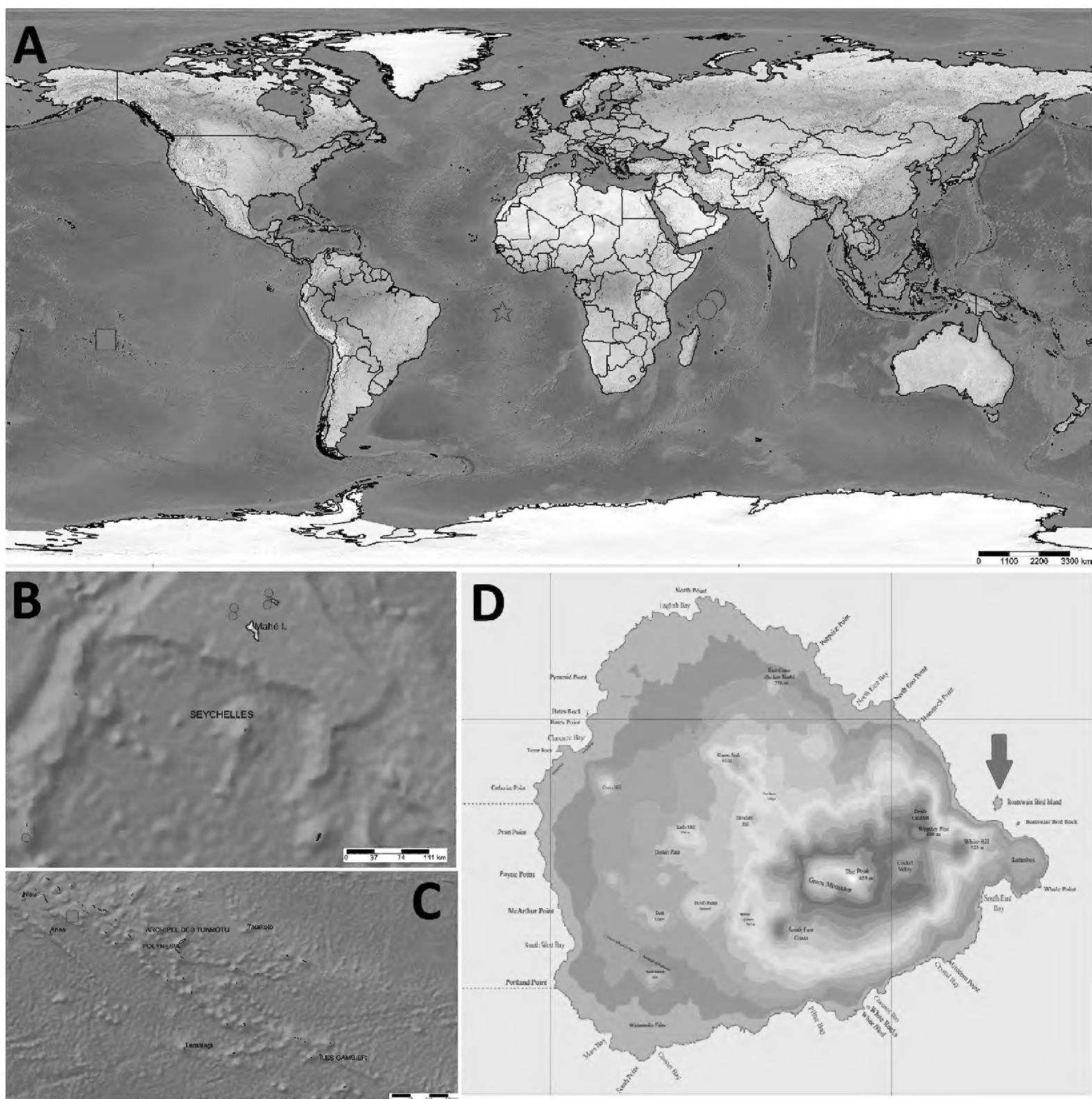


Figure 6. *Clubiona hitchinsi*. Distribution. **A.** Worldwide. **B.** Seychelles (circles, type localities). **C.** Tuamotu archipelago, French Polynesia (square, previous records). **D.** Ascension Island, arrow indicates Boatswain Bird Island. Figure D © Rob984 licensed under CC BY-SA 4.0.

Author Contributions

Conceptualization: DS. Data curation: DS. Formal analysis: DS, YMM. Investigation: DS, YMM, AS. Methodology: DS, YMM. Visualization: DS, YMM. Project administration: DS. Writing – original draft: DS. Writing – review and editing: DS, YMM, AS.

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